

# Test Verification of Conformity

Verification Number: 230400637SHA-V2

On the basis of the tests undertaken, the sample<s> of the below product have been tested with the requirements of the referenced specification<s>/standard<s>. This verification is part of the full test report<s> and should be read in conjunction with it <them>.

Applicant Name & Address:	Zhejiang Narada Energy Technology Co., Ltd Room 341, Building 3, No. 368, Jinpeng Street, Sandun Town, Xihu District, Hangzhou, Zhejiang, 310000, P.R.China
Product Description:	Lithium-ion battery unit
Ratings & Principle Characteristics:	See Appendix (Specifications table)
Models/Type References:	166.4NESP280L*8 pcs
Brand Name:	
Relevant Standards:	Clause 9.1-9.8 (unit level test) of ANSI/CAN/UL 9540A:2019 (Fourth Edition) + UL CRD's
Verification Issuing Office Name & Address:	Intertek Testing Services Shanghai Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
Date of Tests:	2023-06-29 to 2023-07-02
Test Report Number(s):	230400637SHA-002
Manufacturer:	Zhejiang Narada Energy Technology Co., Ltd

Additional information in Appendix.

  
Signature

Name: Max Jin

Position: General Manager

Date: 2023-08-01

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## APPENDIX: Test Verification of Conformity

This is an Appendix to Test Verification of Conformity Number: 230400637SHA-V2

### Specifications table

Mode name	166.4NESP280L*8 pcs
Module series and/or parallel configuration	1P8S
Total number of cells	416
Cooling method	Liquid cooling
Rated capacity	280Ah
Rated energy	372.736kWh
Nominal voltage	1331.2V
Mass of equipment	2950±5 kg
Dimension of equipment	921*1104*2470mm
Standard charge method	
Charge current	140A
End of charge voltage	1497.6V
Standard discharge method	
Discharge current	140A
End of discharge voltage	1164.8V

  
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Summary of testing	
The thermal runaway initiation method <sup>a)</sup>	Heating
Thermal Runaway Propagation	1 cell vented and thermal runaway due to external heating. 51 cells vented and thermal runaway due to thermal runaway propagation. No thermal runaway propagation from initiating module to other modules in initiating unit. No thermal runaway propagation from initiating unit to other units.
Maximum Temperature of Target BESS (°C)	96.1
Maximum Temperature of Wall Surface (°C)	118.8
Maximum Heat Flux on target wall surfaces (kW/m <sup>2</sup> )	2.75
Maximum Heat Flux on target BESS units (kW/m <sup>2</sup> )	1.98
Peak Chemical Heat Release (kW)	62.50
Peak Convective Heat Release Rate (kW)	0
Peak Smoke Heat Release Rate (m <sup>2</sup> /s)	40.73
Total Smoke Heat Release Rate (m <sup>2</sup> )	16304.28
Maximum Heat Flux on Egress Path (kW/m <sup>2</sup> )	--
External Flaming from BESS	Not observed
Flying debris or explosive discharge of gases	Not observed
Sparks, electrical arcs, or other electrical events	Not observed
Re-ignitions	Not observed
<p>Conclusion:</p> <p>a) The performance criteria of the unit level test as indicated in 9.8 of UL 9540A 4th edition has been met. The deflagration protection analysis is not done in this report, it shall be evaluated based on the final installation condition (with the reference to procedure in UL9540A Figure A.3).</p> <p>b) Flaming outside the initiating BESS unit is not observed.</p> <p>c) Surface temperatures of modules within the target BESS units adjacent to the initiating BESS unit do not exceed the temperature at which thermally initiated cell venting occurs.</p> <p>d) Wall surface temperature rise do not exceed 97°C (175°F) above ambient (Temperature was measured continuously, average over every 60 second interval).</p> <p>e) Explosion hazards are not observed during the test.</p>	

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